

The **AMSAT**® Journal

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Volume 34, Number 6

November/December 2011



Spotlight on VUSAT OSCAR 52



A fun place to operate

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A codicil in your will, naming The Radio Amateur Satellite Corporation as a beneficiary will help insure the continuance of the Amateur Radio Satellite program.

Call the AMSAT-NA office at 301-589-6062 for questions on any or all of these ways you can help build new and exciting satellites.

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AMSAT Announcements

Candidates for the AMSAT-NA Board of Directors:

There are six candidates running for the AMSAT-NA Board of Directors. Three of the candidates are current members of the Board whose term expires this year. Ballots will be mailed to the membership by July 15th, and must be received at the AMSAT-NA Silver Spring, MD office no later than the close of business on September 15th, 2012.

Tom Clark, K3IO *

Steve Coy, K8UD

Mark Hammond, N8MH

Lou McFadin, W5DID *

Gould Smith, WA4SXM *

Patrick E. Stoddard, WD9EWK

* Incumbent



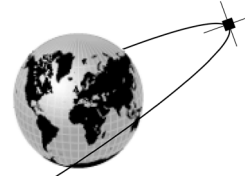
AMSAT's Mission

AMSAT is a non-profit volunteer organization which designs, builds and operates experimental satellites and promotes space education. We work in partnership with government, industry, educational institutions and fellow Amateur Radio societies. We encourage technical and scientific innovation, and promote the training and development of skilled satellite and ground system designers and operators.

AMSAT's Vision

Our Vision is to deploy satellite systems with the goal of providing wide-area and continuous coverage. AMSAT will continue active participation in human space missions and support a stream of LEO satellites developed in cooperation with the educational community and other amateur satellite groups.





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Since my last column several months ago there have been a number of developments for AMSAT that have taken place.

Project Fox

Tony Montiero, AA2TX, reported to the AMSAT BoD on May 2, 2012 that a Preliminary Design Review (PDR) was held over a three evening period the last week in April. Tony reported that the process went very well with good discussion/feedback generated. By the time you read this, Tony will have provided an update on Fox at the AMSAT Forum at Dayton Hamvention. An engineering demo of Fox was also scheduled to be displayed at Dayton and the first engineering prototype is expected to be completed in July 2012.

As you know, AMSAT Fox-1 was accepted into the NASA ELaNa (Educational Launch of Nanosatellite) program and we requested a launch in the second half of 2013. Engineering expects to complete the flight model in January of next year in order to be ready it. We anticipate hearing from NASA again when they are ready to manifest the launch, probably in the early 2013 timeframe.

Other Launch Opportunities

In early February, AMSAT was alerted to another upcoming program known as the NASA Edison small satellite flight demonstration mission Broad Area Announcement (BAA). As noted in the NASA press release, "NASA is seeking proposals for flight demonstrations of small satellite technologies with the goal of increasing the technical capabilities and range of uses for this emerging category of spacecraft." The release also notes, "The topic areas for this solicitation is (sic) limited to demonstrations of communications systems for small satellites, proximity operations with small satellites and propulsion systems for CubeSat-scale satellites." The press release also states, "A selected project must be completed within two to three years at a total cost of no more than \$15 million. The number of awards will depend on the quality and cost of proposals and availability of funding."

Organizations interested in applying for this program had a March 4, 2012 deadline to submit an executive summary of their proposal. NASA would then review the executive summaries and invite selected

parties to formally to submit a formal proposal. Each proposal is due by May 23, 2012 and selection of winning proposals is expected in Fall 2012.

AMSAT suggested a joint venture with another organization and they agreed to work with us on an Edison proposal. In the mean time, AMSAT was asked by two other organizations to participate in Edison proposals. Our engineering team under Tony, AA2TX, evaluated these opportunities and assisted in the development of all three executive summaries which were submitted to NASA. One month later, on April 4, 2012, NASA sent letters of invitation to those organizations whose proposals interested NASA. As it turns out, all three projects in which AMSAT was participating were invited to submit full proposals!

Due to confidentiality concerns, at this point we are not in position to provide specifics on these proposals. AMSAT's participation involves providing technology based upon prior or current AMSAT engineering development work. The timing of these missions, with three-year development timelines, would be completed after the flight of Fox-1 and wouldn't impede our ability to meet existing commitments. All three proposals include having NASA fund the launch costs. Please keep in mind that NASA sent over 100 invitations to organizations that submitted executive summaries, so the prospects that any one particular proposal being accepted is relatively small. While we believe that the proposals currently being developed by our partners and AMSAT (as I write this on May 9, 2012) are competitive, it is clear that there are no guarantees that any of these proposals will be accepted. As noted in the NASA press release, the number of projects selected will be dependent upon the funding required for the winning proposals and how many can be funded under the \$15 million allocated budget.

Meanwhile, our Engineering Team continues to "beat the bushes" for other project opportunities. AMSAT has partnered with Auburn University and The University of Alabama on a National Science Foundation (NSF) grant application that was submitted on May 7, 2012. AMSAT will provide the

continued on page 16 ...



Satellite Export Controls - Progress Report

by Barry Baines, WA4ASW, wa4asw@amsat.org

Since the inception of The International Traffic in Arms Regulations (ITAR) in 1999, all US-built satellites have been subject to the US Munitions List, including Amateur Radio, education and university satellite projects. The Directorate of Defense Trade Controls (DDTC) under the Department of State (DoS) manages ITAR. ITAR has curtailed AMSAT's collaboration with foreign nationals on Amateur Radio Satellite projects, as well as with universities that have foreign students enrolled as any technical exchanges concerning satellite technology with non-US citizens brought the potential for Federal prosecution.

On November 1, 2011, Congressman Howard L. Berman (D-CA) introduced H.R. 3288: "Safeguarding United States Satellite Leadership and Security Act." In summary, this act would authorize the President to remove commercial satellites and related components from the United States Munitions List. However, while AMSAT was pleased to see this draft bill, there were concerns that "commercial satellites" could be interpreted as not including Amateur Radio and education satellites.

Consequently, earlier this year AMSAT President Barry Baines, WD4ASW, appointed AMSAT NY Area Coordinator Peter Portanova, WB2OQQ, as AMSAT's Congressional Liaison to establish relationships that would put AMSAT on the radar regarding H.R. 3288 to ensure that Amateur Radio and education satellites would be included in the final bill. Peter's appointment was based in part on his success in leading a delegation to meet with Congressman Peter King on H.R. 607 in 2011 that resulted in the amendment of that bill to protect the amateur and amateur satellite frequencies that were being considered for auction. Peter was clearly qualified to lead AMSAT's efforts to ensure that Amateur Radio and education satellites would be included in such a bill. Peter notes, "What we accomplished on 607 validates that grass roots efforts can be successful". Over the past few months AMSAT, under Peter's guidance, has taken steps to meet with key personnel involved in the legislative process in Washington to make them aware of AMSAT, the importance of Amateur Radio

satellites in the development of education outreach and potential for emergency communications. All of these meetings have been successful in building awareness of the need to have Amateur Radio satellites (as well as education satellites) removed from the US Munitions List and placed under the Department of Commerce Control List.

While H.R. 3288 has been referred to the House Committee on Foreign Affairs, this initiative was being held up pending a joint report from the Department of Defense (DoD) and Department of State (DoS) required by Section 1248 of the FY2010 Defense Authorization Act wherein Congress directed DoD to assess whether national security would be negatively impacted by moving satellites from the US Munitions List (USML) to the Commerce Control List (CCL). Clearly, the politicians were awaiting this report before deciding whether to support H.R. 3288.

On April 18, 2012 the long awaited "1248" report was released by DoD and DoS: "Risk Assessment of United States Space Export Control Policy," that addresses the risks associated with removing satellites and related components from the United States Munitions List (USML).

The report identifies several satellite types, and related items, that are not purely defense-related and should not be designated as defense articles on the USML or controlled under the International Traffic in Arms Regulations (ITAR).

The Departments recommended that the following items are more appropriately designated as dual-use items on the Commerce Control List (CCL) and controlled under the Export Administration Regulations (EAR):

- Satellites that do not contain technologies unique to military applications or critical for maintaining a military edge;
- Communications satellites (COMSATs) that do not contain classified components;
- Remote sensing satellites with performance parameters below certain thresholds; and
- Systems, subsystems, parts and components associated with those satellites.

From AMSAT's perspective, this is certainly good news for the satellite industry from both a commercial and Amateur Radio/education perspective. In particular, placement of Amateur Radio satellites under EAR would remove the most onerous impacts of ITAR, allowing for example, free exchange of technical information with foreign nationals, allowing collaboration on satellite projects. Actual export of hardware, however, would be controlled by the Department of Commerce. That said, it is too early to draw any conclusions as a 180-day review process has now begun. If the recommendations of the "1248 Report" are accepted, it could pave the way for H.R. 3288 or a bill drafted in response to the "1248 recommendations" to move forward. However, given the tendency of Congress to put off major decisions from May onward pending Fall elections, AMSAT President Barry Baines, WD4ASW, believes that it is likely, based on the current Congress and other factors, very little will occur within the 112th Congress. In Barry's words, "We are pleased with our initiatives to this point. However these activities are still a work in progress." The AMSAT Board, along with AMSAT's Congressional Liaison, will stay focused on these activities and report to the membership as information becomes available.

The 44 page "Department of Defense/ Department of State Report to Congress Section 1248 of the National Defense Authorization Act for Fiscal Year 2010 (Public Law 111-84): RISK ASSESSMENT OF UNITED STATES SPACE EXPORT CONTROL POLICY "is available on-line in PDF format at: <http://tinyurl.com/DoD-1248-Report>

Bloomberg Business Week article on ITAR: <http://tinyurl.com/BusinessWeek-ITAR> (www.businessweek.com)



FUNcube Project Update – Feb 2012

by Jim Heck, G3WGM, g3wgm@amsat.org

The watchwords summarizing the last few months should, I think, be steady progress! We are mindful that on the front cover of the last issue of *Oscar News* we boldly reported that FUNcube-1 and FUNcube-2 are “Go for Launch”. It seems that UKube-1, on which the FUNcube-2 payload is to be carried, will no longer be launched on the same rocket as FUNcube-1. UKube is a much more complicated spacecraft (3-U, with several outsourced payloads). For us this is, on balance, good news having our two FUNcube systems on different rockets really gives us two chances of success without putting all our eggs in one basket. It also means that in the days and weeks after launch we will only have one spacecraft to pay attention to. At the present time the UK Space Agency has announced that they hope to achieve a launch date only a month or two after their original estimate of September 2012. Those who have followed other launches will know that launch delays are to be expected so it is quite possible that FUNcube-2 might, in fact, be launched before FUNcube-1!

Just after Christmas we made a major change to the configuration of the power supply system on FUNcube-1. We had originally intended to fly with an EPS (Electronic Power Supply) from Clyde Space Ltd. (CS), and we had purchased two units from them. One of our originally planned requirements that the CS unit could not fulfil

was to maintain operation of the spacecraft after battery failure. When we selected the CS unit, we were not aware of any other alternatives to meet this requirement. The recent demise of AO-51 due to battery failure, caused us to look again at CubeSat EPS availability, and we identified one that can supply raw power directly from the solar cells to the payload after battery failure. This will have the effect of maintaining operation of the satellite after battery failure whenever it is in sunlight.

This alternative unit is made by GomSpace in Denmark and we are very grateful to them for responding to our requests for information and subsequent order in very quick time. Before making the final decision we made a very careful assessment of the implications of making the change relatively late in the program, weighing the pro and cons. After some considerable discussion among the development team, it was decided that the change of would be ‘a good thing’.

EPS’s aren’t cheap, but the decision to change was made to ensure the maximum possible functional life for the spacecraft. In the event we have been able to use some of the funds that are available to us due to the success of the FUNcube Dongle with Howard’s generosity in donating a portion of the profits made from this project to FUNcube. Thanks (again!) Howard!

Status

It is very satisfactory to be able to report that, as I type this, all the Flight Model hardware has now been produced, with one exception. The Flight Models have all been professionally soldered at ISIS by their ESA qualified solderer for maximum quality of production. What remains to be done is the final alignment and checking of our three PCBs to ensure that, for example, the PA board is operating at maximum efficiency. The CCT board needs no alignment of course.

There is a new PCB that has to be produced and this is a board which will combine the functionality of the PMAS (Passive Magnetic Attitude Control System) and the interface between the Remove Before Flight Plug and the main satellite (PC104) bus. This is not a big task, as designs for the separate parts already exist, and there is no shortage of space.

So what remains for AMSAT to do before we are ready to hand over our PCBs to ISIS for integration and final testing? Of course the answer is software. The change of EPS does mean that we will need to amend, in a fairly minor way, our flight software, and these changes are now in hand. There is still some final alignment and adjustment of the RF components, but it shouldn’t be too long until we can hand over one set of PCBs to ISIS for FUNcube-1 and a second set to Clyde Space for FUNcube-2 (Ukuba) for final integration. ☸



Spotlight on VUSAT OSCAR 52 (VO-52)

by Keith Baker, KB1SF / VA3KSF, kb1sf@amsat.org

(Portions of this article previously appeared as "Spotlight on VUSAT OSCAR 52 (VO-52)" in the February, 2012 edition of *Monitoring Times Magazine*)

In previous columns, I've been assisting those interested in receiving (and if properly licensed) actually working through our growing fleet of Amateur Radio satellites to do so with just modest radio equipment. In this edition, I'll turn the spotlight on one of our newest (linear) analog satellites.

VO-52 (also known as VUSAT and/or HAMSAT INDIA prior to launch) is yet another of AMSAT's so-called "Microsat" series of spacecraft. Weighing in at a rather hefty 42.5 kilograms (93.7 lb), it was launched into a 97-degree inclination, sun synchronous polar orbit as an auxiliary payload aboard an Indian Polar Satellite Launch Vehicle (PSLV-6) on May 5, 2005 by the Indian Space Research Organization (ISRO). VO-52 shared the launch vehicle with CARTOSAT-1, an Indian Remote Sensing satellite, which itself weighed in at a whopping 1,560 kilograms (3,440 lb).

VO-52 was India's first-ever contribution to the international Amateur Radio community and was intended to bring ISRO's satellite services within easier reach of the common man while also popularizing space technology among the masses. What's more, VO-52 met a long-felt need for the Amateur Radio satellite operators in the South Asian region.

What's a Sun Synchronous Orbit?

As VO-52 (along with many other amateur satellites) share this type of orbits, it's

important to know what this term means. A sun-synchronous orbit (sometimes called a heliosynchronous orbit) is an orbit that combines altitude and inclination in such a way that objects in that orbit appear over the same point of the Earth's surface at approximately the same local sun time each day. Satellites that need consistent lighting, such as those that image the Earth's surface in visible or infrared wavelengths (like weather and spy satellites) or for other remote sensing purposes (such as those carrying ocean or atmospheric remote sensing instruments) are routinely launched into sun synchronous orbits. And because VO-52 was launched as a secondary payload aboard a rocket that carried a remote sensing satellite, VO-52 ended up in the same relative sun synchronous orbit as the main payload.

Structure

VO-52 consists of a cube-like structure measuring 630 mm X 630 mm X 550 mm (25 inches X 25 inches X 22 inches) made up of aluminum honeycombs. Passive thermal control is achieved by spinning the satellite at a rate of about 4 RPM with a ± 3 degree spin axis orientation. A tri-axial magnetometer with sun sensors and magnetic torquers act as actuators to provide the required inputs to the spacecraft's onboard electronics, all of which keep the satellite correctly oriented in space. Body mounted solar panels and COTS (Commercial off the Shelf) lithium-ion batteries provide the main sources of onboard power. Multi-element turnstile antennas are also shared between VO-52's transponders and for transmitting downlink telemetry.

Transponders

VO-52 carries two linear (analog) inverting transponders. William Leijenaar, PE1RAH, a Dutch radio amateur and graduate engineering student at the Higher Technical Institute at Venlo in the Netherlands, built the first transponder. Amateur Radio enthusiasts and others at ISRO built the spacecraft's other transponder.

Both transponders operate in Mode U/V (Mode B) with uplinks at 435 MHz and downlinks at 145 MHz (see table). An unmodulated carrier on 145.936 MHz identifies the Indian transponder while the Dutch transponder emits a CW signal on

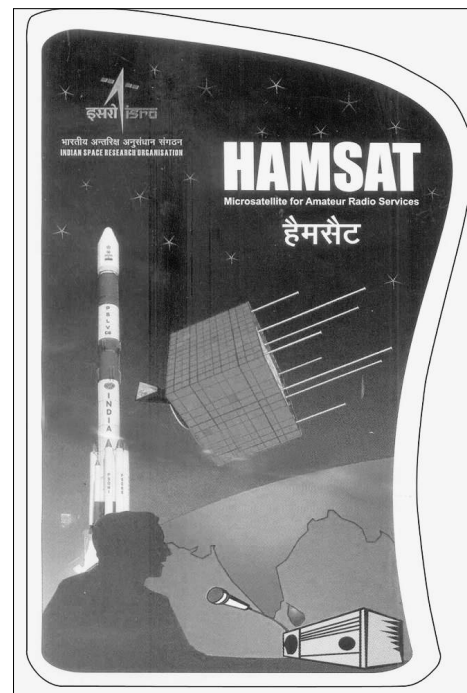


Photo 2: A sticker commemorating the launch of HAMSAT was widely circulated among Indian hams. The satellite later became VO-52 on orbit. (Courtesy: AMSAT-India)

145.860 MHz. The output power of both transponders is about 1 watt. Transponder bandwidth is approximately 60 kHz for the Indian transponder and 50 kHz for the Dutch transponder. Unfortunately, there's not enough spacecraft power to run both transponders simultaneously, so only one transponder can be activated at a time.

How, When and Where to Listen

Since its launch in 2005, VO-52 has become yet another popular linear (analog) Amateur Radio satellite. Its one-watt transponders and turnstile antennas provide surprisingly strong downlink signals ... even for those using modest satellite antenna arrays.

However, because VO-52 is in a relatively low, 646 X 607 Km (about 401 X 377 Mile) orbit, it appears to be moving a lot faster than most other so-called low earth orbit Amateur Radio satellites. This translates into a somewhat smaller footprint on the earth, somewhat reduced access times (on the order of only about 15 minutes or so on each pass) and far more noticeable Doppler shifts on both uplink and downlink signals. This also means that you'll need to keep a fresh set of Keplerian elements running in your satellite tracking software to make absolutely sure



Photo 1: VO-52 sits atop its carrying structure just prior to integration into its PSLV-6 launch vehicle. (Courtesy: AMSAT-India)



Photo 3: A photomontage showing VO-52 and its PSLV-6 launch vehicle prior to launch. (Courtesy: AMSAT-India)

your timing is correct to catch the satellite's entire pass at your location.

As with operation on our other linear satellites, when VO-52 first pops over the horizon, I set my downlink frequency in the middle of the passband (at, say 145.900 MHz) and then send a few widely spaced CW dits on the uplink while tuning the frequency of my uplink signal around. Once I hear my own dits coming back to me on the downlink, I immediately know I'm getting into the bird and I can then start actively looking for a contact.

At press time, VO-52's Indian ground handlers were experiencing some difficulty

with one of the satellite's transponders and were running tests to track down the problem. So, don't be surprised if you discover that both of the satellite's the transponders have been switched off over your location. Just keep trying on another orbit (or on another day) and (hopefully) you will eventually be rewarded with a very pleasant contact through VO-52.

Clearly, our Indian and Dutch counterparts have done a superb job in building and launching this satellite. Hopefully, VO-52 will prove to be the first in a long line of satellites built and launched by AMSAT-India with the help of the ISRO. More

information about VO-52 and AMSAT-India can be found on their Web site at: <http://www.amsatindia.org>.

Looking Ahead

That's all for this time. In future columns, I'll be keeping you up-to-date on all the latest developments in the fascinating world of amateur satellites as well as taking a look back at some interesting early history of various projects that first took Amateur Radio into space. See you then! 🌐

VO52 FREQUENCY AND MODE DATA:

MODE	UPLINK (MHz)	DOWNLINK (MHz)	BEACONS (MHz)
U/V (Indian)	435.220 - 435.280	145.930 - 145.870	145.936 MHz (Carrier)
U/V (Dutch)	435.225 - 435.275	145.925 - 145.875	145.860 MHz (CW)

AMSAT Board of Directors Meeting Minutes November 4 & 5, 2011 San Jose, CA

The meeting was called to order by AMSAT President Barry Baines, WD4ASW, at 08:29 PDT on Thursday, November 4th, 2011.

Members of the Board of Directors present:

Barry Baines, WD4ASW, President
Tom Clark, K3IO
Lou McFadin, W5DID
Drew Glasbrenner, KO4MA, Vice-President, Operations
Gould Smith, WA4SXM, Vice-President, User Services
Alan Biddle, WA4SCA, Secretary
Tony Monteiro, AA2TX, Vice-President, Engineering
Mark Hammond, N8MH, First Alternate
Patrick Stoddard, WD9EWK/VA7EWK, Second Alternate

Other officers present:

Keith Baker, KB1SF/VA3KSF, Treasurer
Martha Saragovitz, Manager

Among the AMSAT members participating and/or observing during the meeting were:

Alex Harvilchuck, N3NP
Bdale Garbee, KB0G
Bill Reed, NX5R
Bill Tynan, W3XO
Bob Davis, KF4KSS
Bryan Klofas, KF6ZEO
Dale Hershberger, KL7XJ
Dan Schultz, N8FGV
Dave Taylor, W8AAS
Dee Interdonato, NB2F
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Larry Brown, W7LB
Keith Packard, KD7SQG
Nick Pugh, K5QXJ
Phil Karn, KA9Q
Steve Culp, K8QKY

Barry opened by welcoming the Board members and visitors. He introduced the newly elected alternate Board members, and reviewed their Bylaw and traditional duties. He then presented the slate of Board officers for approval:

President, Barry Baines, WD4ASW
Vice-President, Operations, Drew Glasbrenner, KO4MA

Vice-President, User Services, Gould Smith, WA4SXM

Vice-President, Engineering, Tony Monteiro, AA2TX

Secretary, Alan Biddle, WA4SCA

Treasurer, Keith Baker, KB1SF/VA3KSF

Manager, Martha Saragovitz

The existing officers were reconfirmed by unanimous consent of the Board. The following Officer positions are currently open:

Executive Vice-President

Vice-President, Human Spaceflight

Vice-President, Marketing

Barry reviewed the schedule of Board and General Meeting events, including closed sessions.

Executive and Other Team Reports

President's report by Barry Baines, WD4ASW

Barry previewed the key points of his general report to the membership at the Annual General Meeting. He began with a review of AMSAT's structure and leadership teams, followed by ITAR and our response to the Directorate of Defense Trade Controls efforts to expand the meaning of "Public Domain," a key issue in simplifying ITAR compliance. A positive outcome would significantly ease the flow of information between AMSAT-NA and other countries. Unfortunately AMSAT'S response is not public domain due to State Department submission procedures. Tom suggested an AMSAT press release, though the issue is now dated. The unified response to HR 607, in coordination with other amateur organizations such as TAPR and the ARRL, was successful, and in the process raised the visibility of AMSAT.

Barry reviewed the latest new, or reorganized, national AMSAT organizations. These included AMSAT-China, AMSAT-India and AMSAT-Francophone. Barry reported that we continue to have a good, though evolving relationship with the NASA Education Office

and the ARISS system. The ARISSat-1 project has been helpful in raising AMSAT's credibility and visibility, with good feedback concerning our educational support. This includes both educational materials, and activities such as the Chicken Little Contest, where people attempt to guess when the satellite reenters. Tom suggested that some additional participation by the ARRL would be useful, as AMSAT is not the exact national equivalent of the Russian Amateur Radio Union.

Unfortunately, AMSAT membership is down to 2008 levels. Various reasons for this, involving issues with the *Journal*, Web site, and valued added by membership, were discussed briefly. Doug Loughmiller, W5BL, and a past AMSAT president, has agreed to take over editorship of *The AMSAT Journal*. The discussion ended with Tom reminding the Board that AMSAT's greatest attraction to the amateur community has been historically and continues to be its technical excellence.

Financially, AMSAT is facing an increasing need to improve fund raising, including going beyond the current satellite user community. Mark suggested specialized, professional fund raising, as do most schools. With AMSAT's record on educational rather than strictly communications projects, it may make sense to revisit professional efforts. Drew made some suggestions to do a better job of mining our internal resources. He pointed out that our use of social media such as Twitter, YouTube and Facebook is growing rapidly. Douglas, KA2UPW/5, suggested that ANS releases might be made available as podcasts, since there are already existing voice broadcasts. The goals for 2012 are primarily for a successful fund effort to continue Fox development, and to improve both the use and documentation of volunteer efforts.

Secretary's report by Alan Biddle, WA4SCA

Alan began by requesting a formal approval of the minutes of the August 2nd, 2011 Board of Directors telecon meeting. This was moved by Barry, seconded by Lou and approved unanimously. The approved minutes will appear in an upcoming issue of *The AMSAT Journal*.



He then reviewed significant administrative actions over the past year. In addition to the October 7th and 8th, 2010 annual meeting, the Board of Directors has held two other formal meetings in the past year, by telecon. The first was the March 1st, 2011 meeting in which the response to HR 607 was decided. The second was the August 2nd, 2011 meeting in which the decision, in light of the condition of AO-51, to fast track a basic Fox-1 spacecraft with a more sophisticated Fox-2 spacecraft to follow was reviewed and approved.

Alan also discussed the 2011 Board of Directors election. This year 751 ballots were received. For comparison, 813 ballots were received in 2010, and 719 in 2009. This drop was a little surprising considering the unusually large number of candidates this year. All nominations were made by the traditional paper petition process this year, with all petitions gathered at the Dayton Hamvention.

Finally, the GoToMeeting software is working very well for both board and technical group issues, and has saved significant travel expenses. He took the opportunity to remind the board that due to the discounted cost program, it will expire, so we need to insure a timely renewal.

Open Treasurer's Report by Keith Baker, KB1SF/VA3KSF

Keith reviewed the previous practice of carrying forward funds and resources from past projects. In consultation with our auditing firm, our practice of capitalizing and accounting for these non-tangible assets is now being changed. To provide for simplification and added transparency in the audit process, such assets will no longer be capitalized in our audits going forward. AMSAT has also traditionally contracted for a comprehensive audit of our financial statements rather than a (less comprehensive) review due to the stringent financial documentation requirements of organizations such as the Combined Federal Campaign (CFC). However, in the past, added income generated by our participation as a CFC charity has been approximately equal to the additional costs of a full-up audit vice a (far less expensive) review. Martha distributed the latest (2010) audit report from Berlin, Ramos for approval. It was moved by Barry and seconded by Gould, that the report be accepted, and that Berlin Ramos be retained for the coming year. The motion was unanimously approved. Finally, Barry

moved, and both Lou and Tom seconded, that AMSAT contract for a review rather than a full audit for 2011-2012. The approval was also unanimous.

Keith also noted that much volunteer work is not being reported, and that which is being reported is somewhat inconsistent as to valuation. Volunteer time is one of the things which potential major contributors consider. Tony suggested switching to an industry type average "salary" system to simplify and encourage reporting. Tom discussed briefly the many substantial but informal contributions made by very senior corporate personnel. Keith ended by reiterating that decreasing membership and contributions are becoming a pressing concern if we are to continue with satellite projects.

User Services Report by Gould Smith, WA4SXM

Gould began with a review of membership and participation. As reported earlier, the current membership is comparable to 2008 levels. So far, we have only one student category member. *The AMSAT Journal* is in the process of transitioning to a new editor and staff and the ANS continues under the editorship of K9JKM, NB2F and KU4OS. The AMSAT Store is bringing in relatively constant amounts, but may be taking some sales from hamfests. Unfortunately both the number of large hamfests, and AMSAT representation, is down as well.

The Dayton presence this year included a large contingent from AMSAT-China. Astronaut Doug Wheelock, KF5BOC, made a very popular visit to the AMSAT booth. The exhibits of ARISSat-1, Fox, and the NextGEN collaboration were very popular in the engineering section. The joint TAPR/AMSAT dinner was well attended, with an interesting presentation on solar power by Bob Bruninga, WB4APR. The AMSAT booth facilities next year will be similar, with the usual need for new exhibit ideas. Douglas, KA2UPW/5, suggested a working transponder, and tutorials for setting up popular HTs for satellite operations.

AMSAT has an Internet program for volunteer applications, but an ongoing problem is matching volunteers with projects. There is high initial interest by volunteers. However, the nature of the solution presented is not always practical, and in some cases the actual follow-through is poor.

Finally, Gould discussed the current and

future hosting arrangements for the AMSAT servers. At some point the UCSD hosting may be lost, which underscores the need for moving to commercial hosting. Tom briefly reviewed how the current server system evolved, and the resulting issues of the AMSAT Store being handled, however indirectly, on a university machine.

ARISSat-1 report by Gould Smith, WA4SXM

Gould reported that ARISSat-1 is working well, daylight only, due to a failed battery cell. The spacecraft spin and attitude are not well defined, though reports indicate the spin is slowing. The BPSK-1000 continues to provide a good stream of telemetry, though the actual efficiency has not been characterized. The project has been an excellent learning experience for the newest generation of AMSAT satellite builders. Since there is a flight spare, plus additional backups, there may be opportunities for additional flights on such platforms as the SpaceX Dragon. These spares can be easily adapted to additional experiments. Alan finished with a summary of the Chicken Little Contest submissions. There were a total of 52 submissions in the adult category, 21 in the K-8 category, and 3 in the high school category. Almost all of the adult submissions came from hams. Most the students were not licensed, though they were part of an organization with one or more licensed advisors. The only continent not represented was Antarctica.

Manager's report by Martha Saragovitz

AMSAT office operations continue normally, with two regular volunteers in the office. With continuing local volunteer support, they are working on fully integrating the existing records in preparation to migration to newer software. The building has several vacant offices, but is still considered safe. We have been assured the rent will remain unchanged over the next year. The accounting is now being done using QuickBooks.

Satellite Operations Report by Drew Glasbrenner, KO4MA

There continues to be a decline in the number of available satellites due to various hardware issues. AO-7 is working well when fully illuminated. It remains popular for its large footprint.

AO-16 is inoperative due to temperature issues associated with periods of eclipse. Unfortunately, it will be several years until illumination may permit a resumption of



operation.

AO-51 is working remarkably well with only 4 of the 6 battery cells functional. Operating at about 1 watt power has provided uninterrupted operation for extended periods. However, it has been limited to a single repeater, and requires significant control station time when a reboot has been necessary. Provisions are being made for automated reboot should that become necessary.

The other FM satellites, AO-27 and SO-50, continue to be heavily used. FO-29 when operative, and VO-52, work well, but have very little use.

ARISS Reports

Dave Taylor, W8AAS, AMSAT's U.S. Delegate to the ARISS-1 working group, gave a brief report. The number of ISS contacts is increasing steadily. There are now 10 telebridge stations, and about a third of all contacts go through one of them. The TM-D700 continues to be the workhorse for this and other ISS operations, though and Erickson UHF equipment is now operating as a simplex digipeater on 437.550 MHz. Dave reported there have been changes in NASA personnel associated with ARISS and a shift in emphasis more heavily to education. This should have minimal impact on participating hams.

The official ARISS-1 meeting was held 28-29 October, 2011 in Houston. There were both regional and committee reports. From a hardware standpoint, an Erickson VHF rig and new power supply is being readied for deployment. The Italian educational program MagISStra, is sponsoring a digital S-band TV, to be called HamTV. Future ARISS-1 activities will focus on new hardware and education.

Lou, W5DID, ARISS U.S. Hardware Manager, reviewed his past history with SAREX and now ARISS. It consists primarily of hardware development and support for ISS Amateur Radio. Barry reminded the Board that ARISS-1 actually has no operating budget, so the individual organizations involved tend to set their own projects. Lou finished his presentation with a review of the new AMSAT storage and development facility in Florida. This was used in the ARISSat-1 project.

Finally, Keith Pugh, W5IU, gave an example of how the ARISS program is working by discussing an ISS contact with the Kiroli Elementary School, West Monroe, LA. The

students were able to ask questions of Dr. Satoshi Furukawa during a 10 minute pass.

AMSAT Engineering by Tony Monteiro, AA2TX

Tony discussed AMSAT's highly productive associations with universities such as SUNY-Binghamton and Penn State. In addition to innovative engineering, it provides essential educational connections needed in today's launch environment. An example is the "wobble gyroscope" currently being planned for *Fox-1* which will allow a more accurate determination of the spacecraft attitude. He reviewed the new engineering process, which is intended to match our world class volunteers with our needs. He discussed AMSAT's efforts to secure a launch in 2013 under the NASA CubeSat Launch Initiative, formerly ELaNi. One unusual characteristic of the program is the need to a self-selected review panel of knowledgeable individuals not associate with the proposal. Tony then reviewed in detail the proposed *Fox-1* configuration.

(For more detailed information, see: "New Strategy for AMSAT *Fox* CubeSat," "AMSAT Engineering Documentation", "*Fox-1* Concept of Operations" and "*Fox-1* Systems Requirements" by Tony Monteiro, AA2TX, and "AMSAT NextGEN Program Satellite Report" by Alex Harvilchuck, N3NP, in the Proceedings of the AMSAT-NA 29th Space Symposium and AMSAT-NA Annual Meeting.)

The Board then transitioned to closed status to discuss potential future projects and financial matters. The Board then returned to open status.

AMSAT Symposium by Martha Saragovitz

The quality of the meeting and facilities is good, but the attendance has been falling while the costs have risen. The location and local promotion are important since a significant number of attendees come from the local area. Keith commented that not all of the benefits of the meeting are financial. It was suggested to try both post card reminders and electronic mailings to those who have AMSAT.ORG mailing addresses next year. The number of these greatly exceeds the current active membership. Gould suggested that the 2012 meeting be held in Orlando, due to available resources, access, and relatively low cost. The Board was in agreement.

The Board meeting was adjourned for the

day at 21:37 PDT.

The Board reconvened at 08:00 PDT in closed meeting to discuss additional financial matters.

The meeting transitioned to open status at 09:30 PDT to resume budget discussions. The remaining issue was the funding of *Fox-1*. It is expected that AMSAT reserves will need to be tapped during the project development, but will be repaid through fund raising efforts. It was moved by Lou, seconded by Tony, and unanimously approved that the budget be approved as amended.

Mark suggested a new membership drive, using an inexpensive but capable HT in AMSAT colors. They would be programmed for current satellite frequencies, and be included with new memberships. Existing AMSAT members would be able to purchase them. Douglas, KA2UPW/5, Drew and Mark will investigate the basic concept, and whether custom modifications might be possible. There was a spirited discussion over the appropriate associated membership fee. The last order of business was recognition of individuals who have made particularly noteworthy contributions to AMSAT and amateur satellites over the past year.

The following people were cited for their particular contributions to AMSAT and its mission over the past year by various members of the Board and other officers:

Mark Steiner, K3MS, Mark Severance, N5XWF, and the entire ARISSat-1 team.

Joseph Armbruster, KJ4JIO, for support of the ARISSat-1 project.

Howard Long, G6LVB, for the LVB tracker and FUNCube Dongle.

Mike Young, WB8CXO, for his continued support of the LVB Tracker.

Martha Saragovitz, for her day in and day out work which makes AMSAT possible.

Bob Carpenter, W3OTC, and Bill Hook, W3QBC, for their faithful office service.

Ed Long, WA4SWJ, for his long service as editor of *The AMSAT Journal*.

Carol Malfatti and the firm of Berlin Ramos for their continuing financial advice and support.

JoAnn Maenpaa, K9JKM, and the entire ANS team.

Peter Portanova, WB2OQQ, and his successful efforts to revise HR 607.



Alan Bowker, WA6DNR, Dave Hartzell, AF6KD, and Don Ferguson, KD6IRE, for managing an outstanding Symposium.

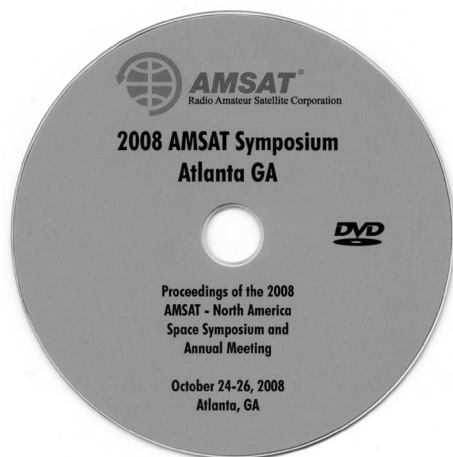
Lance Ginner, K6GSJ, for his historic contributions to amateur satellites, and his outstanding historical talk at the 2011 Symposium.

Bill Tynan, W3XO, for his submission to the Department of State on public domain submission of ITAR materials.

Bob Davis, KF4KKS, for his "Fifty Years in Space" display.

Mark Hammond, N8MH, Mike Seguin, N1JEZ, and Kevin Shuman, WA6FWF, for their continued command station support of AO-51.

There being no further issues, it was moved by Lou, seconded by Gould and unanimously approved by the Board that the meeting be adjourned at 11:28 PDT. 🌐



2008 Proceedings DVD's are available. Contact the AMSAT Office.

A DVD for the 2008 Symposium is available.

It has the presentations, audio files and papers.

Dan Schultz's Banquet Talk on The Hubble Space Telescope Repair Mission - slides and audio

Phil Hartman's Introduction to DSP Workshop - slides and audio plus

2004 Symposium papers

2005 Symposium papers

2007 Symposium papers

The AMSAT Store (see www.amsat.org) is back online! Here is a new AMSAT product. A handsome and functional AMSAT 10' locking carpenter's tape with both inch and metric scales.

Minimum donation: \$5



AMSAT Activities at the 2012 Greater Houston Hamfest

by Andy MacAllister, W5ACM, w5acm@swbell.net
and Allen F. Mattis, N5AFV, n5afv@amsat.org

AMSAT was well represented again this year at the Greater Houston Hamfest (GHH) held March 3, 2012 at the Fort Bend County Fairgrounds in Rosenberg, Texas, southwest of Houston. The GHH is the second largest, and the fastest growing hamfest in Texas. This year the GHH again hosted the American Radio Relay League (ARRL) South Texas Section Convention. Mike Gruber, W1MG, an RF expert from the ARRL Lab, was the keynote speaker.

The GHH had 18,000 square feet of indoor exhibit space, over 120 tables for vendors and individuals, a fox hunt with a \$100 cash prize, an equipment test table, Amateur Radio related presentations and exhibits, VE test sessions, a special event station, and a free tailgate area with early buyer access before the main hall opened.

The AMSAT booth was manned by Andy MacAllister, W5ACM, along with assistance from Allen Mattis, N5AFV, Mike Scarcella, WA5TWT, Charlie Keng, K5ENG, A.C.

Spraggins, W5EZM, and Tom Matthews, K5SAF. AMSAT Director of Contests and Awards, Bruce Paige, KK5DO, was available at the booth to check QSL cards for the ARRL VUCC award, and did a great job with new AMSAT memberships.

Unfortunately there were no OSCAR satellite passes favorable for satellite demonstrations during the hamfest, but the Brazos Valley Amateur Radio Club (BVARC), organizer of the hamfest, came to the rescue. NASA astronaut Captain Lee Morin, KF5DDB, was a special guest speaker at GHH, and after his talk, Captain Morin spent 45 minutes at the AMSAT booth speaking with attendees, handing out autographed photos and answering questions. His new-found interest in Amateur Radio is focused on moon bounce.

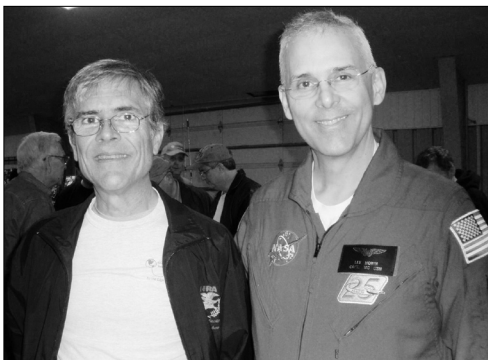
Two talks presented by AMSAT members were well attended. Keynote speaker Mike Gruber, W1MG, from the ARRL was speaking at the same time in another room.

This had some effect on the attendance at the AMSAT talks, but had no effect on the enthusiasm. Allen Mattis, N5AFV, presented a talk entitled "OSCAR Satellites - Feast or Famine", discussing the loss of a number OSCAR satellites in the past two years, yet focusing on upcoming launches of new OSCARs. Andy MacAllister, W5ACM, spoke about BLT-28, the recent South Texas Balloon Launch Team effort to set a world record for a long-duration, long-distance Amateur Radio balloon flight. Although the batteries in the payload froze just above 45,000 feet, the group learned a lot about the methods required to make simple latex weather balloons exceed expectations.

The Brazos Valley Amateur Radio Club (BVARC) had five fabulous raffle prizes this year. The main prize was a Flex Radio 3000, software-defined HF transceiver. The Greater Houston Hamfest continues to grow and we are always invited by BVARC to represent AMSAT with free booth space, power and anything else needed. 🌐



Allen Mattis, N5AFV, (l) with Astronaut Lee Morin, KF5DDB.



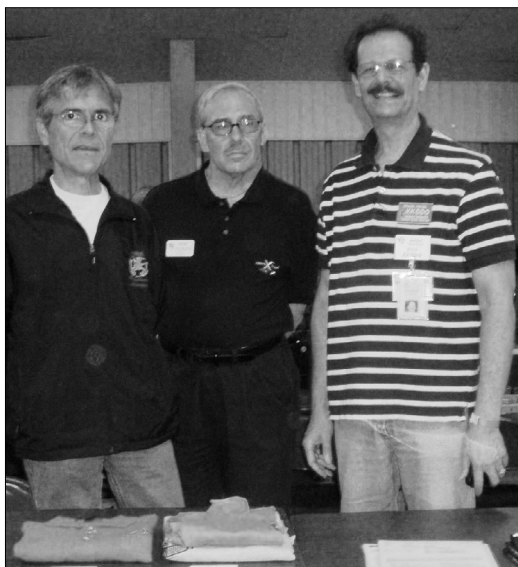
Andy MacAllister, W5ACM (l) with Astronaut Lee Morin, KF5DDB.



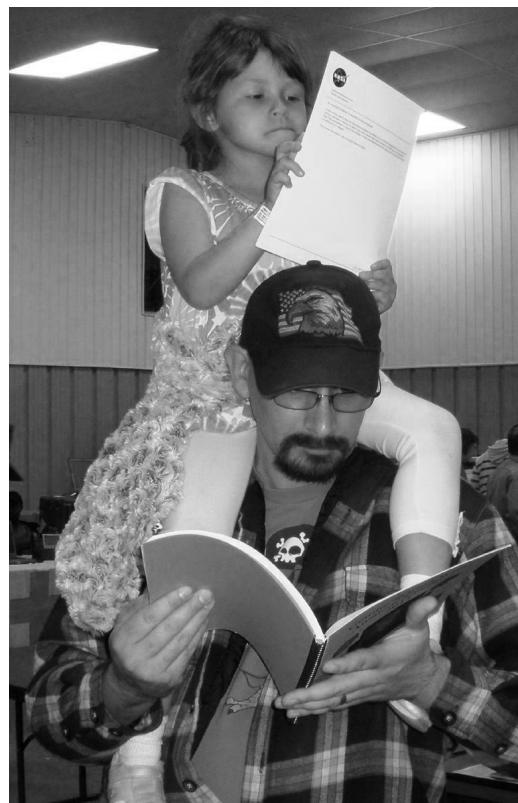
Allen Mattis, N5AFV, talking about the Vega CubeSat launch.



View of the main hall from the AMSAT booth.



Andy, W5ACM, Allen, N5AFV, and Bruce, KK5DO, (l-r) at the AMSAT Booth.



Booth visitor looking at AMSAT's 2011 "Getting Started With Amateur Satellites" while daughter enjoys autographed photograph of Astronaut Morin.

AMSAT is the North American distributor of **SatPC32**, a tracking program designed for ham satellite applications. For Windows 95, 98, NT, ME, 2000, XP, Vista, Windows 7.

Version 12.8b is compatible with Windows 7 and features enhanced support for tuning multiple radios.

Version 12.8b features:

- SatPC32, SatPC32ISS, Wisat32 and SuM now support rotor control of the M2 RC-2800 rotor system.
- The CAT control functions of SatPC32, SatPC32ISS and Wisat32 have been expanded. The programs now provide CAT control of the new Icom transceiver IC-9100.
- The main windows of SatPC32 and SatPC32ISS have been slightly changed to make them clearer. With window size W3 the world map can be stretched (only SatPC32).
- The accuracy of the rotor positions can now be adjusted for the particular rotor controller. SatPC32 therefore can output the rotor positions with 0, 1 or 2 decimals. Corrections of the antenna positions can automatically be saved. In previous versions that had to be done manually.
- The tool 'DataBackup' has been added. The tool allows users to save the SatPC32 program data via mouse click and to restore them if necessary. After the program has been configured for the user's equipment the settings should be saved with 'DataBackup'. If problems occur later, the program can easily restore the working configuration.
- The rotor interfaces IF-100, FODTrack, RifPC and KCT require the kernel driver IOPort.SYS to be installed. Since it is a 32-bit driver it will not work on 64-bit Windows systems. On such systems the driver can cause error messages. To prevent such messages the driver can now optionally be deactivated.
- SuM now outputs a DDE string with azimuth and elevation, that can be evaluated by client programs. Some demo files show how to program and configure the client.

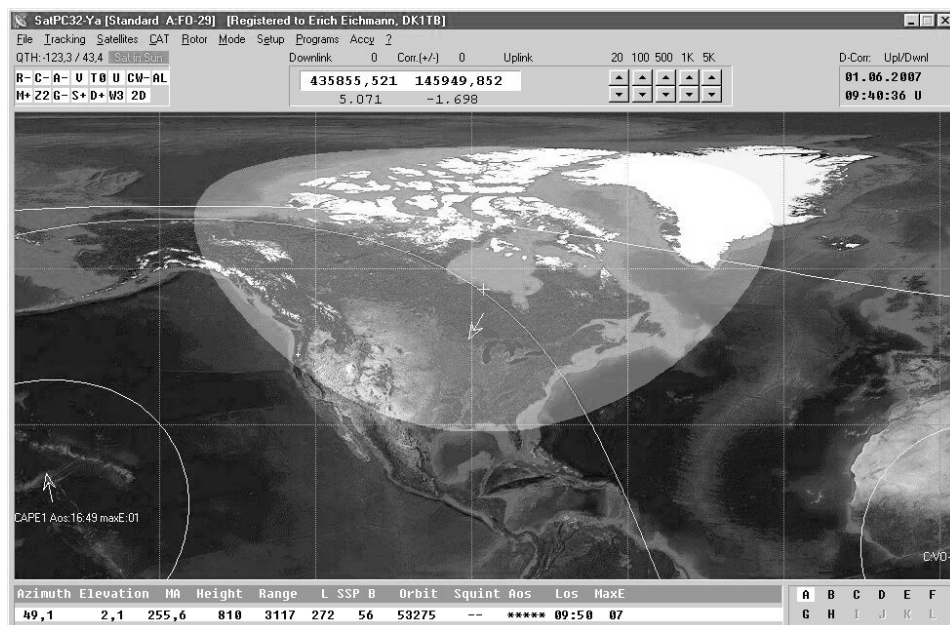
Minimum Donation is \$45 for AMSAT members, \$50 for non-members, on CD-ROM.

A demo version may be downloaded from <http://www.dk1tb.de/indexeng.htm>

A registration password for the demo version may be obtained for a minimum donation of \$40 for members and \$45 for non-members.

Order by calling 1-888-322-6728.

The author DK1TB donated SatPC32 to AMSAT. All proceeds support AMSAT.



Museum Ships Weekend 2012 – A Record-Breaking Year

by Andy MacAllister, W5ACM, w5acm@amsat.org

and Allen F. Mattis, N5AFV, n5afv@amsat.org

This was the fifth year of the Brazos Valley Amateur Radio Club (BVARC) participation in the annual Museum Ships Weekend Event (<http://www.nj2bb.org/museum/index.html>) sponsored by the Battleship New Jersey Amateur Radio Station on June 2-3, 2012. This event always provides an excellent opportunity to demonstrate the OSCAR satellites and Amateur Radio. During the weekend event Amateur Radio operators activated radio stations on 99 museum ships worldwide, up significantly from the 79 ships that participated last year. Approximately 60% of the museum ships were located in the United States; however, museum ships in Australia, Austria, Belgium, Canada, Denmark, France, Germany, Italy, Netherlands, Norway, Portugal, Russia, Spain, Sweden and United Kingdom also participated. Fifteen of the US states participated in MSWE with California having eleven ships, Michigan nine and Texas five. Amateur Radio operators who contacted any fifteen of these ships qualified for a handsome certificate.

During the event the Brazos Valley Amateur Radio Club (BVARC) operated club station KK5W from Seawolf Park on Pelican Island in Galveston, Texas. Seawolf Park is home to two Second World War vintage museum ships - the destroyer escort USS Stewart (DE-238) and the submarine USS Cavalla (SS-244), nicknamed the "Lucky Lady" by submariners. As a result, a contact with KK5W counted for two ships.

BVARC operated from four locations within Seawolf Park. The radio rooms on the two ships were used for operation on the HF

bands primarily using CW. The radio rooms on the ships contain a considerable amount of vintage radio gear that is no longer operational, but serves as a museum display. The Amateur Radio operators brought along their own equipment, but did use the long wire antennas that have been restored on both ships. Two additional operating locations were set up in picnic shelters adjacent to the ships for making primarily HF sideband, VHF FM and satellite contacts. The club made 1,339 radio contacts during the event, and 40 other ships participating in the Museum Ships Weekend event were worked by KK5W. More than 50 Amateur Radio operators participated in the BVARC Seawolf Park operation.

The satellite gear was relatively simple, but more than just an HT with a long whip, or a mobile radio with a handheld beam antenna held out the window. A Yaesu FT-847 was used with an Arrow antenna without duplexer for all operations. A large gel-cell battery was quite sufficient for the Saturday afternoon activity. Allen, N5AFV, coordinated each pass with time and pointing angle information to Andy, W5ACM, (talking head) and Charlie, K5ENG, (human rotator). The arrangement worked very well. Three headsets were parallel wired so that each of the crew could hear the downlink, but avoid audio feedback issues associated with using a speaker. The sea-side location gave excellent horizon-to-horizon coverage in almost all directions.

Two passes each of FO-29 and AO-27 were worked as well as one pass of AO-07. A total of 28 satellite contacts were made

with stations in 17 US states, Cuba and Canada. There were 19 contacts on AO-27, 7 sideband contacts on FO-29 and one contact each on sideband and CW on AO-07.

During the five years that BVARC participated in the Museum Ships Weekend Event, KK5W was the only station to operate on the satellites in years one and two. For years three and four there were only a couple of other ships operating on the satellites and we were not able to make contact with them. This year we finally achieved our goal of working not just one other ship, but three. We thank the satellite operators on the USS New Jersey, USS Nautilus and Lightship Overfalls for our contacts. As in past years it was very enjoyable and rewarding to participate with the Brazos Valley Amateur Radio Club (BVARC) in the annual Museum Ships Weekend Event and we were delighted to see other satellite operators participating in what is becoming a significant world-wide Amateur Radio event. 🌐



Photo 1: Satellite station on table to the right in the picnic shelter during a break between satellite passes. (Photograph by Charles Keng, K5ENG.)



Photo 2: Charles Keng, K5ENG, with Arrow antenna tracking a satellite, while Allen Mattis, N5AFV, and Andy MacAllister, W5ACM, work the bird. (Photograph by Travis Burgess, K5HTB.)



Photo 3: Andy, W5ACM, at the microphone and Allen, N5AFV, working a satellite. (Photograph by Travis Burgess, K5HTB.)



Photo 4: The satellite station was set up beside the submarine USS Cavalla (SS-244). (Photograph by Travis Burgess, K5HTB.)



Photo 5: Conning tower of the USS Cavalla (SS-244). (Photograph by Andy MacAllister, W5ACM.)



Photo 6: Submarine USS Cavalla (SS-244) ready to receive visitors. (Photograph by Andy MacAllister, W5ACM.)



Photo 7: Destroyer Escort USS Stewart (DE-238) ready for Museum Ship Weekend visitors. (Photograph by Andy MacAllister, W5ACM.)



Photo 8: On the left Mike Monsour, AC0TX, and on the right Vaclav Sal, AA7EJ, operate HF SSB from the radio room of the USS Stewart. (Photograph by Andy MacAllister, W5ACM.)



Photo 9: "Cookie" Willis Cooke, K5EWJ, working CW on the HF bands from the radio room of the USS Cavalla. (Photograph by Andy MacAllister, W5ACM.)



avionics for two 3U CubeSats that will contain science hardware provided by Alabama, with spacecraft structure, antennas, and spacecraft integration to be done by Auburn. After a one-year science mission, the satellites will become Amateur Radio FM repeaters. The NSF application includes the funding for launching these satellites. We expect NSF to make a determination in Fall 2012 for which proposal(s) they will accept.

Again I must note that none of these proposals are guaranteed; however, they represent a significant shift in how we are seeking future launch opportunities. Note that we're now working more closely with university and education organizations and that these grant proposals include launch costs. Under each proposal, AMSAT will receive funding in support of providing the hardware that we will deliver. Each mission will include Amateur Radio operations as part of the defined purpose of the satellite. Clearly, if we are successful in these endeavors it will greatly increase our ability to "keeping Amateur Radio in space". Stay tuned for more developments!

ITAR

ANS-120 released on April 28, 2012 contained a news item regarding recent developments pertaining to proposed changes to ITAR. Given the significance of the release of the Department of Defense/Department of State "1248 Report" which recommends removing commercial (non-military) satellites from ITAR with transfer to the Department of Commerce Export Arms Regulations (EAR), this news item is included in this issue of *The AMSAT Journal* as well. If you haven't read this article, I encourage you to read it as it also describes the efforts that AMSAT has undertaken in the past five months to support HR-3288. I cannot over emphasize the significant efforts undertaken by Peter Portanova, WB2OQQ, (AMSAT's Congressional Liaison) and others to build awareness within the legislative branch of the negative impacts of ITAR on Amateur Radio, university and educational organizations. While the "1248 Report" adds support for H.R. 3288, given the election cycle that we're currently in, I don't expect much progress until the next session of Congress. In the meantime, AMSAT will continue to abide by current ITAR requirements as we take appropriate steps to further encourage changes to the law.

The AMSAT Journal

As you've undoubtedly noted, this issue of the *Journal* is over five months late getting to the membership. This is not something that we're proud of. We fully recognize that the *Journal* is the key membership benefit that AMSAT provides. The magazine provides official information to the membership and is the one 'tangible' that everyone receives for being an AMSAT member. I recognize that we need to get the *Journal* back on schedule.

The reasons for not getting the *Journal* published on time are several. While we have previously announced that Doug Loughmiller, W5BL, will be the new editor with the next issue (technically, the January/February 2012 issue), the delay in publication is not due to the transition, but due to lack of materials for publication. *The AMSAT Journal* is traditionally a 32-page publication. Over the years many people have contributed articles that have enhanced the quality of the publication and have set the standard for what gets published. A key benefit of membership is having access to informative articles pertaining to Amateur Radio in space through our publication.

Over the past two years, however, we have seen a significant decrease in the enthusiasm level regarding submission of articles for publication. Editors like to keep the hopper full regarding articles ready for publication, so that the development time for creating the next issue is minimized. Once an issue is sent to the printer, the editor already has materials on hand to plan out the next issue and simply needs to add late breaking items, such as the president's Apogee View column to complete the issue in a reasonable period of time. AMSAT has traditionally followed this process.

Currently, we have no articles in the hopper. The editor is literally waiting for materials to add to the issue under development. Consequently, we find ourselves in a poor position to get the *Journal* completed as we await submissions. Clearly, this is not a good thing and greatly increases the difficulty in completing each issue.

Adding to the challenge is that our traditional band of authors who have a reputation for submitting multiple articles over the course of the year are no longer writing as much as they once did. We need to encourage more people to consider writing articles to share their experiences and provide insight

into amateur satellite activities. While many consider *The AMSAT Journal* to be a technical journal, it is more than that. The *Journal* is a reflection of the organization and the interests of our membership.

Please consider submitting an article, photos, etc. on satellite activities that you're involved in. If you're representing AMSAT at hamfests, write an article about that hamfest and what was done to highlight Amateur Radio in space. If you are involved with school activities and used amateur satellites as part of the educational experience, please tell us about it. If you have advice to give on building an amateur satellite station, please share it in an article. If you supported an DXpedition that included amateur satellite activity, please let us know about it. If you have homebrewed some equipment as part of your satellite station, please share your experiences. The potential subject matter can be whatever you care to write about, keeping in mind that the audience are AMSAT members who are interested in space-related subjects.

The AMSAT Journal deserves your support. Please help us to keep both the quality and timeliness of publication at the level of quality that we've all come to expect.

Silent Keys

AMSAT lost two significant members since last publication of *The AMSAT Journal*. On February 14, 2012 **Dick Daniels, W4PUJ**, lost his battle with cancer. Dick's impact on AMSAT since the organization's founding in 1969 right through the launch of AO-51 in 2004 was significant and far-reaching. Jan King, W3GEY/VK4GEY, wrote a detailed and touching tribute to Dick that was posted on the AMSAT Web site main page at the time of his death and Memorial Service. You can find the write-up here:

[http://www.amsat.org/amsat-new/images/fck_images/W4PUJ_Obituary\(1\).pdf](http://www.amsat.org/amsat-new/images/fck_images/W4PUJ_Obituary(1).pdf)

Dick loved AMSAT and his deep involvement in the organization was reflected by the request of his wife of fifty-four years, Jackie to have the president of AMSAT participate in the "Moments of Remembrance" during the Memorial Service that took place on February 24 in Arlington, VA. A number of AMSAT members were there at the service and I was honored to speak on AMSAT's behalf. I used Jan's write-up as the basis for my remarks, but I added my own observations about Dick's impact at Board meetings: When Dick spoke, everyone listened. I also



noted that it perhaps it was both appropriate and a good omen that the day that we lost Dick was the same day that AMSAT's Fox-1 project was selected by NASA's ELaNA program, representing another opportunity for "keeping Amateur Radio in space" which Dick helped to establish. Many of Dick's friends and fellow members of Little Falls Presbyterian Church were not aware of Dick's significant technical contributions to the amateur satellite program, and so I spent some time during the reception speaking with individuals highlighting Dick's impact on AMSAT. It was indeed a privilege to represent AMSAT at such a solemn event and to help celebrate the Life of Richard Lester Daniels, W4PUJ (SK).

AMSAT also lost another stalwart member, **Dee Interdonato, NB2F**, (see photos below) who passed away on April 8, 2012. ANS-106, released on April 14 included the announcement of Dee's death and provides a summary of his many contributions to AMSAT. Dee always impressed me with his enthusiasm, dedication and work ethic supporting AMSAT. He represented AMSAT at numerous hamfests and swapmeets in New Jersey. He helped out every year at the AMSAT booth at Hamvention (upon arrival

at the AMSAT hotel in the Dayton area, one of the first vehicles I recognized each year was Dee's pickup with the "NB2F" license tag). Dee was forthright concerning his observations and feedback from what he picked up from individuals who stopped by at hamfests. He attended the AMSAT Symposium every year and participated in the Area Coordinator breakfasts. He was outspoken about how Area Coordinators could make a difference and he wasn't shy about making his opinions known in a positive and fruitful way. As a member of the AMSAT News Service Team, Dee helped to ensure that our premier news gathering process kept up with its weekly releases. Dee was a warm and welcoming individual who represented AMSAT with class and enthusiasm in front of many audiences. He is indeed missed.

AMSAT Symposium

Please mark down on your calendar the upcoming 30th AMSAT Symposium, which takes place October 26-28, 2012 in Orlando, FL. The Symposium venue is the Holiday Inn - Orlando International Airport. This year's Symposium local committee is led by Lou McFadin, W5DID, and Dave Jordan, AA4KN. Plans are being made for a tour of

Kennedy Space Center on Monday, October 29. In addition, Orlando is a great place for bringing family and airfares into Orlando are very reasonable. AMSAT has negotiated a \$99.00/night room rate with complimentary wireless Internet access.

Symposium is a great opportunity to learn about the latest satellite developments and meet with the AMSAT leadership. Expect presentations on Project Fox, updates on Amateur Radio activities on the International Space Station, and other technical topics. Symposium is also an opportunity to greet old friends and meet new ones who are as enthusiastic about the amateur satellite program as you are.

I continue to be impressed by the great work of our volunteers and the advances being made by our Engineering Team, particularly with regard to Fox-1. Your continued support for AMSAT will ensure that we move forward in keeping "Amateur Radio in space."

73,
Barry Baines, WD4ASW
President

Dee Interdonato, NB2F, Silent Key



Dee Interdonato, NB2F (SK).



Dee with XYL Ginny, N2EYN.



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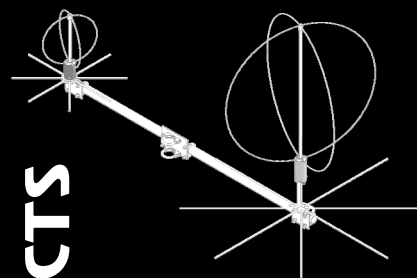
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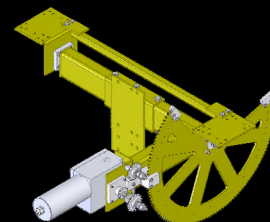


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Every **Silver Donor** receives gifts of:

- ✓ Everything at the Bronze Donor Level, PLUS:
- ✓ A personal invitation to a reception with the AMSAT Directors, Officers and project designers and builders (free).
- ✓ Annual endorsement sticker after each year of donation.

- ☐ \$50 / month
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Every **Bronze Donor** receives gifts of:

- ✓ A unique "AMSAT President's Club" certificate.
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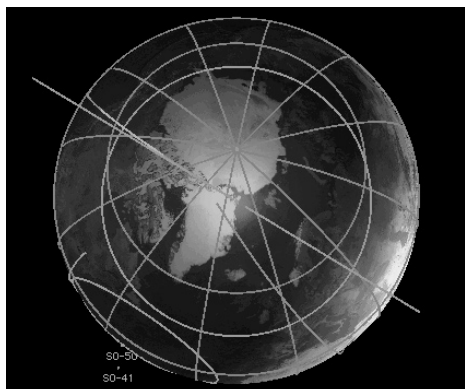
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Help Wanted AMSAT needs qualified volunteers for a number of positions!

If you want to be a part of the solution in making AMSAT operational and work toward designing, building and finding a launch, WE NEED YOU!

No pay for 5+ hours per week, but a great deal of satisfaction in knowing you are helping make something happen.

We need people with these skills:

- Marketing
- Sales
- Software engineering
- Hardware engineering
- PC based software design
- Web design and maintenance
- Project management
- Documentation
- Hardware testing
- Software testing
- Hardware prototyping
- Specific area Web site information maintenance
- Video recording, digital conversion and editing
- Write technical or instructional material
- Educational activities
- Promoting AMSAT as an Area Coordinator



and any other area you think you think you can make a difference.

We often have people volunteer, but many don't deliver on their promises. So, pick an area that you think needs improvement and explain what you will do to make it better. Then do something to show that you can follow through.

Send your suggestions, actions plans and a description of why you are capable of doing this task to Gould Smith, WA4SXM, wa4sxm@amsat.org



2011 AMSAT BoD Meeting, Symposium & General Meeting

November 3, 4 & 5, 2011 San Jose, CA

AMSAT President Barry Baines opened the AMSAT Board of Directors meeting on Thursday morning, November 3, 2011 in a meeting room of the Wyndham San Jose hotel. He welcomed the board members, officers and 20+ visitors to the meeting. The newly elected alternate board members were introduced and the group reviewed their bylaw and traditional duties.

AMSAT Board of Directors

Barry Baines, WD4ASW

Tom Clark, K3IO

Lou McFadin, W5DID

Drew Glasbrenner, KO4MA

Gould Smith, WA4SXM

Alan Biddle, WA4SCA

Tony Monteiro, AA2TX

Mark Hammond, N8MH, 1st alternate

Patrick Stoddard, WD9EWK/VA7EWK, 2nd alternate

The first order of business was to confirm the AMSAT officers for 2011-2012. The existing officers were reconfirmed by unanimous consent of the Board.

President, Barry Baines, WD4ASW

Vice-President, Operations, Drew Glasbrenner, KO4MA

Vice-President, User Services, Gould Smith, WA4SXM

Vice-President, Engineering, Tony Monteiro, AA2TX

Secretary, Alan Biddle, WA4SCA

Treasurer, Keith Baker, KB1SF/VA3KSF

Manager, Martha Saragovitz

The following officer positions are currently open:

Executive Vice-President

Vice-President, Human Spaceflight

Vice-President, Marketing

Barry presented his 2011 President's report. This report is available for on the AMSAT Web site front page as a pdf download.

Financially, AMSAT is facing an increased need to improve fund raising including going beyond the current satellite community. AMSAT's educational mission hasn't been as productive as needed for many years and needs to become a priority. In December 2011 Mark Hammond, N8MH, agreed to take on the position of Vice President-

Educational Relations and will create a team and a plan to address the educational mission. Tom Clark, K3IO, reminded the Board that AMSAT's greatest attraction has been historically and continues to be its technical excellence. The goals for 2012 are primarily for a successful fund effort to continue Fox development, to increase membership, to improve our educational outreach and to improve both the use and documentation of volunteer efforts. The minutes of the 2011 BoD meeting should be available by spring 2012 after the Board approves them. These will be published in *The AMSAT Journal*.

The rest of the day was taken up by team reports by the AMSAT officers. The upcoming BoD minutes will cover these Team Reports.

Gould volunteered to manage the 2012 Symposium in Orlando, due to available resources in Orlando, access and relatively low cost. The board was in agreement.

Friday Night Reception

AMSAT hosted a reception for all the attendees in the hotel on Friday evening. Finger foods and a cash bar were available. Members took advantage of this opportunity to discuss amateur satellites, make new friends and catch up with old friends. The evening continued with many of the attendees getting together for technical discussions late into the night in the bar and hotel lobby. Jan King, VK4GEY/W3GEY, one of the AMSAT founders, satellite guru, and project manager for the American sponsored OSCAR 5 – WO-19 satellites, had a rapt following all during the meeting. Jan now lives in Australia and works worldwide on various commercial satellite projects. It was wonderful to have Jan at the Symposium and have the opportunity to talk with him once again.

Symposium Presentations

2011 Symposium Presentation Schedule

Friday November 4, 2011

Bryan Klofas, KF6ZEO: "Frequency Allocation for Government-funded CubeSats: NSF Paves the Way"

Nick Pugh, K5QXJ: "How to Light the Candle"

Michael Safyan, KJ6MVL: "NASA Ames PhoneSat"

David Palmer, KB5WIA: "A Satellite-Portable Backpacking Trip to Rare California Grid Square CM79"

Hans van de Groenendaal, ZS6AKV: "SA AMSAT CubeSat Project 'KLETSKous'"

Bob Davis, KF4KSS: "Orbital Elements and Magnetic Tumble in Excel"

Alexander J Harvilchuck, N3NP: "2010-2011 AMSAT NextGen Program Satellite Report"

Jan King, VK4GEY/W3GEY: "Australis-OSCAR-5"

Saturday November 5, 2011

Lou McFadin, W5DID: "Fabrication, Integration and Testing of ARISSat-1"

Gould Smith, WA4SXM: "ARISSat-1 in Flight"

Douglas Quagliana, KA2UPW/5: "Decoding Satellite Telemetry from ARISSat-1"

Steven Bible, N7HPR: "ARISSat-1 Operational Survey"

Gould Smith, WA4SXM: "ARISSat-1 Post Mortem"

Tony Monteiro, AA2TX: "Space Radiation and Fox Program"

Barry Baines, WD4ASW: "The Importance of Educational Outreach for AMSAT"

Tony Monteiro, AA2TX: "AMSAT Fox-1 Systems Overview"

Bob Davis, KF4KSS: "Fox 1 Mechanical Design"

Hans van de Groenendaal, ZS6AKV: "Turning University CubeSats into Amateur Radio Satellites"

Bob Davis, KF4KSS: "Fox 1 Thermal Design"

Dave Taylor, W8AAS for Mark Steiner, K3MS: "ARISS and Education: Who will join AMSAT in 2031?"

Sawson Taheri, KG6NUB: "OSCAR Zero from a Satellite Operator's Perspective"

Annual Meeting

Following the presentations the AMSAT Annual Meeting took place in the main room. The crew was unable to maintain an online Echolink presence of the meeting. We expect to have the 2012 Annual Meeting live on Echolink. AMSAT President Barry Baines opened the meeting by giving a "Status of



AMSAT” presentation to the group. This presentation is available on the front page of the AMSAT Web site as a pdf download. Questions from the audience were solicited and answered. The rest of the meeting was spent recognizing those that made exceptional contributions to the organization over the last year. Those selected and their volunteer efforts are listed below.

2011 AMSAT Awards Citations **Gould Smith, WA4SXM**

In Recognition of Your Outstanding Contributions to Multiple AMSAT Projects
Your role in the success of ARISSat-1 cannot be overstated. Your leadership as project manager, your direct involvement in the development of www.arissat1.org, and your efforts to create educational content for the ARISSat-1 project are unmatched. AMSAT’s membership and user services continue to provide significant content for our members as reflected in the great work done in the weekly ANS Bulletins and quality of *The AMSAT Journal*. Your efforts are also reflected in the overall success that AMSAT enjoyed this year with the AMSAT booth at the Dayton Hamvention. Thank you for your hard work and dedication which has made a significant difference for AMSAT.

Anthony Monteiro, AA2TX

In Recognition of Your Outstanding Contributions to AMSAT’s Engineering Team

Thank you for your leadership of the AMSAT Engineering Team. The Fox Team is well-established and making significant progress in defining our next satellite. Your role in supporting ARISSat-1 with both the SDX software and analysis of the Orlan silver-zinc battery made a significant difference as performance of the satellite was evaluated following deployment. Your working relationship with SUNY-Binghamton has created a new opportunity for AMSAT in mentoring students. You also represented AMSAT at the Small Payloads Ride Share Workshop that took place earlier this year, creating new networking relationships. Your management and leadership style has enhanced AMSAT Engineering and is appreciated.

Keith Baker, KB1SF

In Recognition of Your Outstanding Contributions as AMSAT’s Treasurer

Thank you for serving as AMSAT’s Treasurer for the past year. You have meticulously

kept tabs of AMSAT’s finances and kept the AMSAT Board of Directors apprised of financial impacts and implications. You have also maintained a relationship with the Dayton Amateur Radio Association (DARA) leadership. Your willingness to serve AMSAT is sincerely appreciated.

Andrew Glasbrenner, KO4MA

In Recognition of Your Outstanding Contributions to AMSAT Satellite Operations

Thank you for leading the AMSAT Operations Team which spent considerable effort dealing with the battery issues of AO-51. The team’s efforts to develop an analysis of what was happening to the satellite’s battery cells, coupled with steps taken to try to maintain availability of the satellite given the battery cell failures experienced to date, is reflective of the team’s outstanding dedication to keeping the satellite in service. Your success in working ARISSat-1 and demonstrating the viability of the linear transponder despite damage to the 70 cm receive antenna was a welcome relief to the ARISSat-1 team and great news to share with the Amateur Radio community.

Alan Biddle, WA4SCA

In Recognition of Your Outstanding Contributions to AMSAT Administration and the Fox Project

Thank you for the great work you’ve done this year as Secretary and ‘administrative support.’ You’ve been meticulous in handling the minutes of BOD meetings, releasing them for review shortly after the meetings take place and arranging for publication in *The AMSAT Journal*. You’ve handled every task that you’ve been asked to perform, such as tackling the task of coordinating AMSAT’s response to H.R. 607 with the ARRL and managing the process of AMSAT recognition. When the President hasn’t been in position to chair the various leadership telecons, you’ve handled it. In addition, you are managing the AMSAT ‘Chicken Little Contest’ for ARISSat-1. Your work in understanding the Space Radiation Environment has made important advances in the development of the Fox Project. Your support for AMSAT is most greatly appreciated.

William Tynan, W3XO

In Recognition of Your Outstanding Contributions to AMSAT’s Government Liaison

Thank you for drafting AMSAT’s response to the Directorate of Defense Trade Controls (DDTC) proposed changes to ITAR. AMSAT’s submission highlights the importance of the public domain and creating an environment where materials may be placed in the public domain more easily is critical to AMSAT. Your willingness to step forward and handle this important task is appreciated.

Ed Long, WA4SWJ

In Recognition of Your Outstanding Contributions to AMSAT’s Technical Communications

The AMSAT Journal is a critical link between the membership and the organization. It is the one item that is delivered to each member six times per year. As Editor of the *Journal*, you have crafted a magazine that is highly regarded both inside and outside of AMSAT. Thank you for your leadership and time to create an outstanding publication that reflects AMSAT’s activities and direction. Your efforts are sincerely appreciated.

Steve Coy, K8UD

In Recognition of Your Outstanding Contributions to AMSAT’s Presence at the Dayton Hamvention

Thank you for your support of AMSAT in the Dayton area. You serve as the ‘destination’ for AMSAT materials being shipped for the Dayton Hamvention. You have been very successful in building support for AMSAT within the Dayton Amateur Radio Association (DARA). You have represented AMSAT at various local hamfests. Your support is sincerely appreciated.

Peter Portanova, WB2OQQ

In Recognition of Your Outstanding Contributions to AMSAT

Thank you for your initiative and dedication to help AMSAT with H.R. 607. As a constituent of Rep. Peter King and having contacts within his district, you arranged for a meeting that included ARRL representatives to address Amateur Radio’s concerns with H.R. 607. You briefed him on the important work done by AMSAT and the negative impact that H.R. 607 would have on our amateur satellite program. Your one-on-one conversation coupled with a well-developed presentation played an important role in convincing Rep. King to modify his bill. You have also continued your faithful service in representing AMSAT at hamfests and special operating events. Clearly, you have made a



difference for Amateur Radio and AMSAT.

Steve Belter, N9IP

In Recognition of Your Outstanding Contributions to AMSAT's ARISSat-1 Educational Outreach

Thank you for taking the lead on developing the ARISSat-1 "Certificate of Recognition" for individuals who have heard ARISSat-1 directly. This has generated significant worldwide interest, with over 700 certificates issued to date. Your efforts have helped AMSAT's educational outreach, as these programs help to encourage non-amateurs to listen for the satellite.

David Jordan, AA4KN

In Recognition of Your Outstanding Contributions to AMSAT Technical and Educational Outreach

Thank you for your support of the ARISSat-1 project. Your article in the February 2011 issue of QST did much to publicize the satellite's capabilities. You developed AMSAT News Release materials for aviation, space and science publications that helped to publicize ARISSat-1. You've taken on the task of developing and publicizing the ARISSat-1 CW Contest which is designed to encourage non-amateurs to decode CW transmissions and identify key call signs. Your support of ARISS by developing publicity on every upcoming ARISS school contacts has helped to alert the public to upcoming school contacts. As area coordinator, you have supported major local hamfests. Your persistence in working these avenues of information dissemination has made a difference for AMSAT.

Rick Hambly, W2GPS

In Recognition of Your Outstanding Contributions to AMSAT User Services

You have maintained the AMSAT Web site, working with contributors to insure that the information is current and readily available. For many today, a Web site makes the first impression of an organization. You have made ours a positive, professional experience.

Patrick Stoddard, WD9EWK

In Recognition of Your Outstanding Contributions to AMSAT Field Operations

You have represented AMSAT at hamfests and special events throughout the Southwest. Your operations from many remote grid locations, and exemplary operating skills, have attracted new satellite operators while

setting a positive example. You "Elmer" new satellite operators by freely sharing your knowledge and experience. We thank you for your faithful service and outreach.

Chuck Pinkham, K3PER

In Recognition of Your Outstanding Contributions to AMSAT User Services

You have been an integral part of AMSAT's presence at the Dayton Hamvention for years. You handled the routine and the unexpected effortlessly, and are there from setup to takedown. Your sustained efforts have helped make this a highly successful opportunity to tell the wider amateur community the AMSAT story.

Bruce Paige, KK5DO

In Recognition of Your Outstanding Contributions to AMSAT User Services

You have maintained the AMSAT Online Store, which helps support the organization by making readily available various services and products. You have also handled the administration of the various AMSAT awards which recognize the achievements of satellite operators. Both have contributed significantly to creating the feeling of an AMSAT "Family."

James French, W8ISS

In Recognition of Your Outstanding Contributions to AMSAT User Services

You have faithfully maintained the AMSAT Weekly Satellite Report. This collection of detailed, reliable information is an essential source for both new and veteran satellite operators. It continues to be an essential "One Stop" resource.

Keith Pugh, W5IU

In Recognition of Your Outstanding Contributions to AMSAT Field Ops and the Dayton Hamvention

Year after year, you have represented AMSAT at hamfests and other activities, showing people the wonder of satellite communications. At the Dayton Hamvention, you have braved the elements to demonstrate that working satellites can be done with modest equipment. For many people, you are truly the first face of AMSAT. We thank you for your faithful service and outreach.

JoAnne Maenpaa, K9JKM

In Recognition of Your Outstanding Numerous Contributions to AMSAT User Services

You have been one of the true voices of

AMSAT. As an ANS Editor, you help produce a weekly news bulletin of AMSAT and amateur satellite-related news items. You keep the AMSAT Web site updated with new information, and assist contributors in conveying their information in a clear, interesting style.

Lee McLamb, KU4OS

In Recognition of Your Outstanding Contributions to AMSAT User Services

With gratitude for your dedicated service to AMSAT in producing the weekly AMSAT NEWS Service. This has enabled many to keep up-to-date with the many projects and activities in the amateur satellite community.

Mike Young, WB8CXO

In Recognition of Your Outstanding Contributions to AMSAT User Services

With gratitude for your continued service to AMSAT in producing, testing and supporting the popular LVB Tracker boxes. Your coordination of the AMSAT software exhibitions at the Dayton Hamvention helps show us at our best.

Ray Hoad, WA5QGD

In Recognition of Your Outstanding Contributions to AMSAT User Services

With gratitude for your continued service to AMSAT in maintaining and updating the weekly Keplerian elements on the AMSAT Web site, and making them available through distributions channels which support users worldwide.

Dee Interdonato, NB2F (SK)

In Recognition of Your Outstanding Contributions to AMSAT User Services

Along with producing the weekly AMSAT NEWS and your numerous contributions to AMSAT Field Operations, you have undertaken special projects such as the ARISSat-1 Reception Certificates. These have helped spread the AMSAT story, not only to hams, but those who are learning about Amateur Radio through satellites.

Mark Hammond, N8MH

In Recognition of Your Outstanding Contributions to AMSAT Operations

Thank you for your continued support and increasing leadership within the Operations Team. Your dedication to AO-51, and willingness to assist with other satellite projects, is an important asset to AMSAT.



Kevin Schuchmann, WA6FWF

In Recognition of Your Outstanding Contributions to AMSAT Operations

Thank you for your continued assistance as our West Coast command station for AO-51. Your reliability and willingness to be there when most needed is an important asset to AMSAT.

Mike Seguin, N1JEZ

In Recognition of Your Outstanding Contributions to AMSAT Operations

Thank you for your continued assistance as our command station for AO-7 and other projects. Your reliability and willingness to be there when most needed is an important asset to AMSAT.

OZ7SAT Team

In Recognition of Your Outstanding Contributions to AMSAT Operations

Thank you for the continued support of AO-51 and other amateur satellites by providing live telemetry over the Internet from the outstanding OZ7SAT ground station. Your contributions are important and greatly appreciated.

Ib Christoffersen, OZ1MY

In Recognition of Your Outstanding Contributions to AMSAT Operations

Thank you for your support of AO-51 and participation in the Operations Team via the AO-51 Modes email list.

Doug Papay, KD8CAO

In Recognition of Your Outstanding Contributions to AMSAT Operations

Thank you for your support of AO-51 and participation in the Operations Team via the AO-51 Modes email list.

Colin Hurst, VK5HI

In Recognition of Your Outstanding Contributions to AMSAT Operations

Thank you for your support of AO-51 and participation in the Operations Team via the AO-51 Modes email list. Your telemetry analysis has always proven helpful and insightful.

Phil Karn, KA9Q

In Recognition of Your Outstanding Technical Contributions to Amateur Satellite Operations

The new telemetry protocols you developed for AO-40, and extended for ARISSat-1, have made it possible for stations worldwide to receive, decode and forward

telemetry using simple equipment. This has been instrumental in encouraging a new generation of student and amateur satellite experimenters.

Howard Long, G6LVB

In Recognition of Your Outstanding Technical Contributions to Amateur Satellite Operations

Your work on Software Defined Transponders is significantly advancing the state of the art of upcoming satellites. The LVB Tracker has enabled many stations to track amateur satellites. The development of the inexpensive FUNcube Software Defined Radio Dongle has allowed stations worldwide to receive and process ARISSat-1 transmissions. The availability of inexpensive, versatile equipment has helped encouraged a new generation of student and amateur satellite experimenters.

Jonathan Brandenburg, KF5IDY

In Recognition of Your Outstanding Contributions to the Fox Satellite Project

Your work on the Internal Housekeeping Unit software has made important advances in the development of the Fox Project. AMSAT thanks you for your dedication and contributions to this key component of AMSAT's next generation of satellites.

Robert Davis, KF4KSS

In Recognition of Your Outstanding Contributions to the Fox Satellite Project

Your work on the Fox mechanical design has made important advances in the development of the Fox Project. AMSAT thanks you for your continued dedication and contributions to this key component of AMSAT's next generation of satellites.

Joe Fitzgerald, KM1P

In Recognition of Your Outstanding Contributions to the Fox Satellite Project

Your work administering the network server and e-mail systems has facilitated the communications and information storage needed in the development of the Fox Project. AMSAT thanks you for your dedication and contributions to this essential support of AMSAT's next generation of satellites.

Bdale Garbee, KB0G

In Recognition of Your Outstanding Contributions to the Fox Satellite Project

Your work on the Internal Housekeeping Unit card hardware has made important

advances in the development of the Fox Project. AMSAT thanks you for your continued dedication and contributions to this key component of AMSAT's next generation of satellites.

Braddock Gaskill, W3BCV

In Recognition of Your Outstanding Contributions to the Fox Satellite Project

Your work on the Internal Housekeeping Unit card hardware has made important advances in the development of the Fox Project. AMSAT thanks you for your dedication and contributions to this key component of AMSAT's next generation of satellites.

Alex Harvilchuck, N3NP

In Recognition of Your Outstanding Contributions to the Fox Satellite Project

Your work as the Advisor to the SUNY Senior Design Program, the "AMSAT Skunk Works," has guided the student team's important advances in the development of the Fox Project. AMSAT thanks you for your dedication and contributions to AMSAT's next generation of satellites.

Dick Jansson, KD1K

In Recognition of Your Outstanding Contributions to the Fox Satellite Project

Your work and expertise in thermal analysis and design has been essential to the development of the Fox Project. AMSAT thanks you for your continued dedication and contributions to AMSAT's next generation of satellites.

Jim Johns, KA0IQT

In Recognition of Your Outstanding Contributions to the Fox Satellite Project

Your work on the Internal Housekeeping Unit software has made important advances in the development of the Fox Project. AMSAT thanks you for your dedication and contributions to this critical component of AMSAT's next generation of satellites.

John Klingelhoetter, WB4LNM

In Recognition of Your Outstanding Contributions to the Fox Satellite Project

Your work on the RF card has made important advances in the development of the Fox Project. AMSAT thanks you for your dedication and contributions to this key component of AMSAT's next generation of satellites.

Bryan Klofas, KF6ZEO

In Recognition of Your Outstanding



Contributions to the Fox Satellite Project

Your essential systems engineering has been instrumental in the orderly development of the Fox Project. AMSAT thanks you for your dedication and contributions to this key component of AMSAT's next generation of satellites.

Keith Packard, KD7SQG

In Recognition of Your Outstanding Contributions to the Fox Satellite Project

Your work on the Internal Housekeeping Unit card hardware has made important advances in the development of the Fox Project. AMSAT thanks you for your dedication and contributions to this key component of AMSAT's next generation of satellites.

David Ping, WB6DP

In Recognition of Your Outstanding Contributions to the Fox Satellite Project

Your antenna design has made important advances in the development of the Fox Project. AMSAT thanks you for your dedication and contributions to this key component of AMSAT's next generation of satellites.

Bill Reed, NX5R

In Recognition of Your Outstanding Contributions to the Fox Satellite Project

Your work on the Internal Housekeeping Unit software has made important advances in the development of the Fox Project. AMSAT thanks you for your dedication and contributions to this key component of AMSAT's next generation of satellites.

Jay Schwartz, WB8SBI

In Recognition of Your Outstanding Contributions to the Fox Satellite Project

Your work on the Internal Housekeeping Unit software has made important advances in the development of the Fox Project. AMSAT thanks you for your dedication and contributions to this key component of AMSAT's next generation of satellites.

Ron Tassi, N3AEA

In Recognition of Your Outstanding Contributions to the Fox Satellite Project

Your work on the power system has made important advances in the development of the Fox Project. AMSAT thanks you for your dedication and contributions to this key component of AMSAT's next generation of satellites.

Jerry Zdenek, N9YTK

In Recognition of Your Outstanding Contributions to the Fox Satellite Project

Your work on the Internal Housekeeping Unit card hardware has made important advances in the development of the Fox Project. AMSAT thanks you for your dedication and contributions to this key component of AMSAT's next generation of satellites.

Jerry Buxton, N0JY

In Recognition of Your Outstanding Contributions to the Fox Satellite Project

Your systems engineering has been instrumental in the development of the Fox Project. AMSAT thanks you for your dedication and contributions to this key component of AMSAT's next generation of satellites.

Steve Bible, N7HPR

In Recognition of Your Outstanding Contributions to the ARISSat-1 Satellite Program

Your efforts in publicizing ARISSat-1, including the blog in EE Times, have insured that information about the development of ARISSat-1 has been made available to the wider technical community. AMSAT thanks you for your continued dedication and contributions to this key aspect of the project.

Lou McFadin, W5DID

In Recognition of Your Indispensable Contributions to the ARISSat-1 Satellite Program

Your work in preparing the ARISSat-1 satellite for launch was the indispensable final pre-deployment effort in the ARISSat-1 Project. AMSAT thanks you for your continued dedication and contributions to this key component of AMSAT's most recent project.

Mark Severance, N5XWF

In Recognition of Your Outstanding Contributions to the ARISS and ARISSat-1 Teams

Thank you for all that you've done for ARISS and ARISSat-1 in particular. We would never have succeeded in getting the satellite deployed without your direct involvement and knowledge of the 'personas' in RSC-Energia. You served as an interface with RSC-Energia when plans were made to operate the spacecraft from within the ISS. You played a critical role in communicating

AMSAT's concerns to the ISS Operations Center and RSC-Energia about the condition of the 70 cm antenna during Russian EVA-29, and then conveying our request for deployment once we realized the antenna was installed but damaged. Your support for ARISSat-1's educational outreach opportunities is sincerely appreciated.

Mark Steiner, K3MS

In Recognition of Your Outstanding Contributions to the ARISS and ARISSat-1 Teams

Thank you for your significant contributions to ARISS and ARISSat-1. You played a crucial role in developing and then guiding the ARISS team in the transition to a new school selection process, establishing new processes for the ARISS Operations Team to work with school candidates. Your actions to alert Mark Severance, N5XWF, of AMSAT's concerns about the 70 cm antenna on ARISSat-1 prior to deployment during Russian EVA-29 provided time for an evaluation of the antenna's condition prior to actual deployment, and then you conveyed AMSAT's desire to deploy with a damaged antenna. You have served as Vice Chair of ARISS-I and led our weekly US ISS-Ham telecons each week. Your support of ARISS and AMSAT is sincerely appreciated.

Douglas Quagliana, KA2UPW/5

In Recognition of Your Outstanding Contributions to the ARISSat-1 Satellite Program

Thank you for developing the Windows ARISSat-1 Ground Station Telemetry software, and managing the server used to collect this data. This provides a means for users to view current data via the mobile screen online. In addition, you also provided significant statistical summaries of ground station support for telemetry reception, which is important for briefing NASA Education on the degree of interest that this satellite has generated. This approach of using ground stations around the world to collect telemetry from a satellite and making it available to users for review and analysis opens new opportunities of students and others to study satellite performance and use 'real world' experiences in the classroom. Your support for ARISSat-1 is sincerely appreciated.

Gilbert Mackall, N3RZN

In Recognition of Your Outstanding Contributions to the ARISSat-1 Satellite



Program

Thank you for developing the ARISSat-1 Ground Station Telemetry software for the Macintosh platform. This software provides a means for users to view current data that they've downloaded from the satellite and forward it to a central server. The use of ground stations around the world to collect telemetry from a satellite and making it available to users for review and analysis opens new opportunities for students and others to study satellite performance and use 'real world' experiences in the classroom. Your support for ARISSat-1 is sincerely appreciated.

Joseph Armbruster, KJ4JIO

In Recognition of Your Outstanding Contributions to the ARISSat-1 Satellite Program

You have continued your support of ARISSat-1 operations both on the Web site and at the facility in Orlando throughout the year. You have always stepped forward to help in whatever way you can, not matter what you are asked to do. Thanks for being there!

Rosalie White, K1STO

In Recognition of Your Outstanding Contributions to the ARISS Team

Thank you for your guidance and input as ARISS transitions to a new school selection process for ARISS US school contacts, and AMSAT's operations team adapts to new processes for school support. Your willingness to help our team to develop new procedures, and taking the time to ensure that organizational concerns are addressed, is appreciated. The result of this effort is continued strong support by NASA Education for the ARISS school contact program.

David Taylor, W8AAS

In Recognition of Your Outstanding Contributions to the ARISS Team

Thank you for your guidance and input as ARISS transitions to a new school selection process for ARISS US school contacts and AMSAT's operations team adapts to new processes for school support. Your willingness to help our team develop new procedures, and taking the time to ensure that organizational concerns are addressed, is deeply appreciated. The result of this effort is continued strong support by NASA Education for the ARISS school contact program. Your support of ARISS-I as AMSAT's US delegate is also appreciated.

Charles Sufana, AJ9N

In Recognition of Your Outstanding Contributions to the ARISS Team

You have maintained the ARISS Operations Web page, making it an invaluable resource for current information, as well as a source of interesting and fun information and statistics. AMSAT thanks you for your long, dedicated service to the ARISS Team.

Debbie Brown Biggs

In Recognition of Your Outstanding Contributions to the ARISS Team

You have made significant contributions towards enhancing the education content, value and reporting of the ARISS program and increasing its value to NASA. AMSAT thanks you for your dedicated service.

Alan H. Bowker, WA6DNR

In Recognition of Your Outstanding Contributions to the 2011 AMSAT Symposium

Your willingness to assume the leadership in managing the Symposium at a late date, and effective direction, made the San Jose, California meeting a great success. Thanks to you, and your entire team, for this contribution to AMSAT!

Dave Hartzell, AF6KD

In Recognition of Your Outstanding Contributions to the 2011 AMSAT Symposium

You have been a key supporter in making everything work. Whatever and whenever something was needed, you got it done quickly and well. AMSAT extends its sincere thanks to you for making the San Jose, California meeting a great success.

Don Ferguson, KD6IRE

For your valuable participation in the 2011 AMSAT Space Symposium. Thanks to you and the entire team for this contribution to AMSAT.

Clint Bradford, K6LCS

In Recognition of Your Outstanding Contributions to the 2011 AMSAT Symposium

Thank you for your efforts as Symposium Prize Chair. Your energy and focus on details to secure prizes was very successful, resulting in a myriad of prizes for this year's Symposium. Your efforts are greatly appreciated.

Daniel Schultz, N8FGV

In Recognition of Your Outstanding Contributions to the 2011 AMSAT Symposium

Thank you for editing the *AMSAT Proceedings* once again. Your willingness to fulfill this critical function is deeply appreciated, as the *Proceedings* are an important component of the overall success of the Symposium.

Lance Ginner, K6GSJ

In Recognition of Your Outstanding Contributions to the 2011 AMSAT Symposium

Thank you for serving as the 2011 AMSAT Symposium Banquet Speaker. You have had a distinguished Amateur Radio career, coupled with the critical roles that you fulfilled in the early days of amateur satellites, particularly OSCAR 1 through OSCAR 8. Your willingness to share your recollections and provide fascinating insights into the early days of the amateur satellite program is deeply appreciated.

Ron Parise, WA4SIR, Technical Excellence Award

Dr. Tom Clark, K3IO, founded the Ron Parise Technical Excellence Award. The first recipients of the award were announced during the AMSAT General Meeting

1) Phil Karn, KA9Q, for his innovative design and development of the AO-40 digital downlink protocols and the ARISSat-1 BPSK1000 digital protocol.

2) Howard Long, G6LVB, for his G6LVB antenna control hardware and software and his creative 70-1300 MHz receiver known as the FUNcube Dongle. This award will be presented in the future as worthy innovators are identified.

Photos of the 2011 Symposium

Art Feller, W4ART, has graciously provided access to the photographs he took during the 2011 Symposium in San Jose. Have a look at the fun we had. Join us in Orlando October 2012.

http://www.afeller.us/Studio_dArt/Personal_Galleries/Pages/AMSAT_2011.html

Display Room

Adjacent to the conference room was the Display Room. Here Bob Allison, WB1GCM, had the OSCAR 1 satellite that he rejuvenated on display. The working ARISSat-1 prototype was on view as well as two Fox models, by Bob Davis, KF4KSS.



Bob Davis also built a beautiful OSCAR-1 and Fox satellite model in a display case. This was to be auctioned off during the Saturday night banquet. The rear portion of the room was also turned into an interview area. Bob Allison, WB1GCM, (with Jerry Ramie, K16LGY, doing the videography) interviewed Lance Ginner, K6GSJ; Barry Baines, WD4ASW; Jan King, VK4GEY; Gould Smith, WA4SXM; Keith Baker, KB1SF and Carroll Swain, W7GU. These informative interviews are available on YouTube under the *callsign* Interview title by ARRLHQ. http://www.youtube.com/watch?v=NJ_-2wNmFqc.

AMSAT Banquet

Saturday night the attendees re-assembled in the banquet room for the Banquet and to meet and listen to OSCAR 1 team member Lance Ginner, K6GSJ. After dinner there was a high stakes auction for Bob Davis' OSCAR 1/Fox models in a case. Alan Bowker, WA6DMR, served as the spirited auctioneer. It finally came down to back-and-forth bidding between Barry and Lance, with Lance making the final bid. Lance was happy with his model and AMSAT received a nice donation. Thanks to Bob Davis for such an attractive, well constructed model.

Lance gave a very interesting talk with period photographs that covered the development of OSCAR 1, other OSCAR projects, the transfer of AO-5 to the fledging AMSAT organization and described the difficult negotiations in getting the OSCAR 1 satellite manifested aboard a secret mission. Getting a low cost launch continues to be a formidable task for all of the AMSAT launches since. Dave Hartzell, AF6KD, made a video of Lance's presentation. It can be found on YouTube at <http://www.youtube.com/watch?v=EWSCCZY1FgQ&feature=youtu.be>.

The evening concluded with the drawings for prizes. Clint Bradford, K6LCS, obtained most of the prizes and Barry Baines got the three top prize donations. Herb Sullivan, K6QXB, won the Yaesu FT-60R; Carl Reisinger, KG6ESX, won the Kenwood TH-D72A, and Don Ferguson, won the ICOM IC-7000.

Prize Donors

Icom IC-7000

Kenwood TH-D72

Yaesu FT-60R

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Pryme

HRO-Anaheim

Better Tomorrow

Sierra Radio Systems

Ventenna

WIRED Comms

CQ Publications

High Sierra Microwave

Elk Antennas

FunCube Dongle (donated by KO4MA)

Autographed photo of Doug Wheelock, KF5BOC (donated by WA4SXM)

Field Ops Breakfast

About 25% of the AMSAT Field Operations team was present for the Sunday morning Field Ops breakfast. I gave an update of the past year for the Field Ops team, noting that we had an AMSAT presence at more hamfests than in previous years. I/we also didn't take full advantage of the ARISat-1 satellite in the school environment. I proposed that that was a matter of not knowing how to get the schools interested in a presentation and providing them with materials and a convincing argument about why they should give us time with the students. What followed was one of the best discussions at the Field Ops breakfast in many years.

As a result Joe Spier, K8WAO, EMike McCardel, KC8YLD, and Mark Hammond, N8MH, agreed to work together to come up with some plans on how best to use the AMSAT satellites for educational purposes. Later in 2011 Mark Hammond was named AMSAT VP of Educational Relations.

IARU Meeting

Following the Field Ops Breakfast Hans van de Groenendaal, ZS6AKV, chaired an hour long session concerning IARU issues.

Sunday Trips

Following the early morning meetings there were two scheduled trips: 1) the downtown Technology Museum and 2) the Stanford 150 foot dish. The museum trip turned out to be oriented toward a little less technical audience, but it was a beautiful day for a trip downtown. Bryan Klofas, KF6ZEO, lead and arranged for the trip to the Stanford antenna. About a dozen people enjoyed the trip, the view from the antenna structure and operation of the large antenna.

2012 AMSAT Symposium and General Meeting

Orlando will be the host city for the 2012 Symposium from Friday, October 26 to Sunday, October 28, 2012. Mark your calendars for an interesting, informative and convivial time in Orlando. The Symposium will be held at the Holiday Inn Orlando Airport. Rooms will be \$99 +taxes. You will be able to register online for the Symposium shortly after the Dayton Hamvention. The AMSAT Board meeting will take place in the same hotel on Thursday and Friday, October 25-26.

Proposed Monday trip to the Kennedy Space Center

We are looking to gauge the interest in those attending the 2012 AMSAT Symposium for a Monday Trip (October 29) to the Kennedy Space Center. Those interested please e-mail Martha (martha@amsat.org). The trip will include a round trip bus from the hotel and entrance to the Space Center. The cost will be about \$100. This is a wonderful experience for those that haven't been and for those that have been multiple times. We need to get an idea of how many will participate to select the correct bus, so please email Martha with the number in your party that would be interested. 🌐



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